Matrix MXE-3000 Series

MXE-3002

User's Manual

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Revision History

Revision	Release Date	Description of Change(s)
2.00	2011/04/26	Initial release

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Preface

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Getting Service

Contact us should you require any service or assistance.

ADLINK Technology, Inc.
Address: 9F, No.166 Jian Yi Road, Zhonghe District
New Taipei City 235, Taiwan
新北市中和區建一路 166 號 9 樓
Tel: +886-2-8226-5877
Fax: +886-2-8226-5717
Email: service@adlinktech.com

Ampro ADLINK Technology, Inc.
Address: 5215 Hellyer Avenue, #110, San Jose, CA 95138, USA
Tel: +1-408-360-0200
Toll Free: +1-800-966-5200 (USA only)
Fax: +1-408-360-0222
Email: info@adlinktech.com

ADLINK Technology (China) Co., Ltd.
Address: 上海市浦东新区张江高科技园区芳春路 300 号 (201203)
300 Fang Chun Rd., Zhangjiang Hi-Tech Park,
Pudong New Area, Shanghai, 201203 China
Tel: +86-21-5132-8988
Fax: +86-21-5132-3588
Email: market@adlinktech.com

ADLINK Technology Beijing
Address: 北京市海淀区上地东路 1 号盈创动力大厦 E 座 801 室(100085)
Rm. 801, Power Creative E, No. 1, B/D
Shang Di East Rd., Beijing, 100085 China
Tel: +86-10-5885-8666
Fax: +86-10-5885-8625
Email: market@adlinktech.com

ADLINK Technology Shenzhen
Address: 深圳市南山区科技园南区高新南七道 数字技术园
A1 栋 2 楼 C 区 (518057)
2F, C Block, Bldg. A1, Cyber-Tech Zone, Gao Xin Ave. Sec. 7,
High-Tech Industrial Park S., Shenzhen, 518054 China
Tel: +86-755-2643-4858
Fax: +86-755-2664-6353
Email: market@adlinktech.com

ADLINK Technology (Europe) GmbH
Address: Nord Carree 3, 40477 Duesseldorf, Germany
Tel: +49-211-495-5552
Fax: +49-211-495-5557
Email: emea@adlinktech.com

ADLINK Technology, Inc. (French Liaison Office)
Address: 15 rue Emile Baudot, 91300 Massy CEDEX, France
Tel: +33 (0) 1 60 12 35 66
Fax: +33 (0) 1 60 12 35 66
Email: france@adlinktech.com

ADLINK Technology Japan Corporation
Address: 〒101-0045 東京都千代田区神田鍛冶町 3-7-4
神田 374 ビル 4F
KANDA374 Bldg. 4F, 3-7-4 Kanda Kajicho,
Chiyoda-ku, Tokyo 101-0045, Japan
Tel: +81-3-4455-3722
Fax: +81-3-5209-6013
Email: japan@adlinktech.com

ADLINK Technology, Inc. (Korean Liaison Office)
Address: 서울시 서초구 서초동 1506-25 한도 B/D 2 층
2F, Hando B/D, 1506-25, Seocho-Dong, Seocho-Gu,
Seoul 137-070, Korea
Tel: +82-2-2057-0565
Fax: +82-2-2057-0563
Email: korea@adlinktech.com

ADLINK Technology Singapore Pte. Ltd.
Address: 84 Genting Lane #07-02A, Cityneon Design Centre,
Singapore 349584
Tel: +65-6844-2261
Fax: +65-6844-2263
Email: singapore@adlinktech.com

ADLINK Technology Singapore Pte. Ltd. (Indian Liaison Office)
Address: No. 1357, "Anupama", Sri Aurobindo Marg, 9th Cross,
JP Nagar Phase I, Bangalore - 560078, India
Tel: +91-80-65605817
Fax: +91-80-22443548
Email: india@adlinktech.com

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1 Introduction

1.1 Overview

The Matrix MXE-3000 series is the latest addition to ADLINK's Matrix E series, based on the Intel® Atom™ D510 dual-core processor and offering enhanced computing power. The MXC-3000 series features an Intel® Atom™ D510 dual-core 1.66 GHz processor boosting performance to nearly double that of the Atom™ N270 platform, with no increase in power consumption. This distinctive feature enables access to multiple devices using a compact and rugged controller with no need for additional serial communication cards.

Leveraging the proven design of the Matrix MXE-1000 series, the MXE-3000 series retains all the significant features of the Matrix E series, including rugged -20°C to 70°C* fanless operation, 5 g vibration resistance, and 9-32 VDC wide range power input. The serial port design is also flexible to meet the needs of a wide variety of applications. Two COM ports can be configured to RS-232, RS-422, or RS-485 via a BIOS setting. The MXE-3000 series is also equipped with a mini-PCIe port, USIM port, six USB 2.0 ports, and its fanless and cable-less structure supports extensive durability for long-term usage. Combing rugged design and integrated I/O functions, the ADLINK MXE-3000 series is the best choice for versatile applications.

1.2 Features

- Intel® Atom™ D510 1.66 GHz processor + Intel® ICH8-M chipset
- Rugged, -20 to 70°C fanless operation*
- Built-in 9 VDC to 32 VDC wide-range DC power input
- Two software-programmable RS-232/422/485 ports, and two RS-232 ports
- Up to three 1000/100/10 Mbps Ethernet ports
- Up to six USB 2.0 ports
- Two external SATA ports
- One internal PCIe Mini Card port and USIM port
- One external CF port

Note: This option guarantees cold boot of the system at -20°c and operation with 100% loading at 70°c. The industrial solid-state drive storage option is required.

1.3 Specifications

MXE-3002	
Processor	Intel® Atom™ D510 1.66 GHz CPU
Chipset	Intel® I/O Controller Hub 8 Mobile (ICH8-M)
Video	▶ Analog CRT by D-sub connector, supports up to QXGA (2048 x 1536) resolution ▶ 18-bit LVDS output by DVI-I connector
Memory	1 GB DDR2 667 MHz SODIMM module
I/O Interface	
Ethernet	3x GbE port (1x Realtek® 8111C + 2x Intel® 82574L)
Serial Ports	▶ 2x software-programmable RS-232/422/485 (COM1 & COM2) ▶ 2x RS-232 (COM3 & COM4) .
USB	6x USB 2.0 ports
Audio	1x Mic-in and 1x Speaker-out
KB/MS	1x PS/2 keyboard and 1x PS/2 mouse (Need S3 wake up)
Mini PCIe	1x mini PCIe port
USIM	1x USIM port
WDT	Support Watchdog Timer
Power Supply	
DC Input	Built-in 9-32 VDC wide-range DC input 3P pluggable connector with latch (V-, GND, V+)
AC Input	Optional 80 W external AC-DC adapter for AC input

MXE-3002	
Storage	
SATA HDD	On-board SATA port for 2.5" HDD/SSD installation
Compact Flash	1x Type II CF port, supporting PIO and DMA modes
eSATA	2x eSATA interface connectors on front panel for storage expansion
Mechanical	
Dimensions	210(W) x 170(D) x 53(H) mm (8.3" x 6.7" x 2.1")
Weight	1.8 kg (3.97 lb)
Mounting	Wall-mount kit
Environmental	
Operating Temperature	-20°C to 70°C (-4 to 158°F) (w/o HDD or w/ Industrial SSD/CF)
Storage Temperature	-40°C to 85°C (-40 to 185°F) (excl. HDD/SDD/CF)
Humidity	to 95% @ 40°C (104°F) (non-condensing)
Vibration	Operating, 5 g, 5-500 Hz, 3 axes (w/ CF or SSD)
	Operating, 0.5 g, 5-500 Hz, 3 axes (w/ HDD)
Shock	Operating, 100 g, half sine 11ms duration (w/ CF or SSD)
EMI	CE, FCC

1.4 Unpacking Checklist

Before unpacking, check the shipping carton for any damage. If the shipping carton and/or contents are damaged, inform the dealer immediately. Retain the shipping carton and packing materials for inspection. Obtain authorization from the dealer before

returning any product to ADLINK. Ensure that the following items are included in the package.

- MXE-3002 controller
- VESA-100 wall-mount bracket (located under the MXE-3002)
- Screw pack for wall-mounting and HDD fixing
- User's manual
- ADLINK All-in-One DVD

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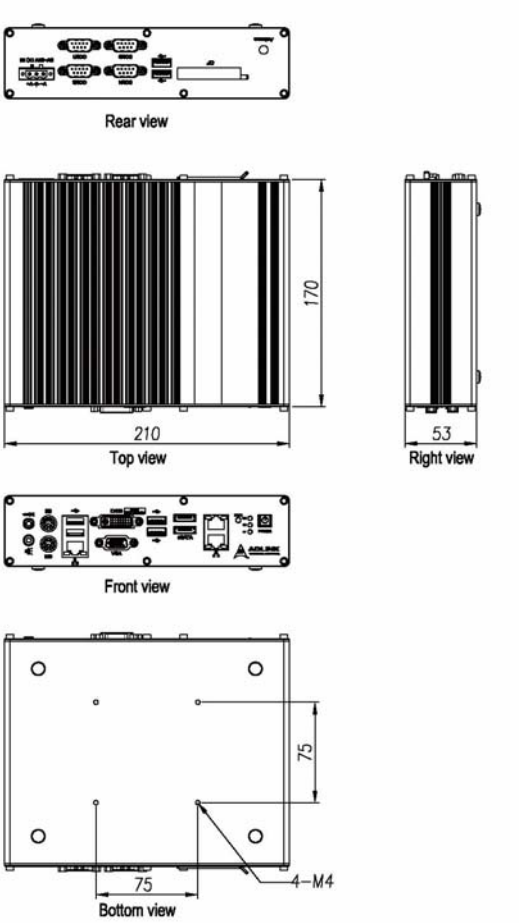
2 System Description

This section describes the appearance and connectors of the MXE-3002 controllers, including chassis dimensions, front panel connectors, rear panel connectors, and internal IO connectors.

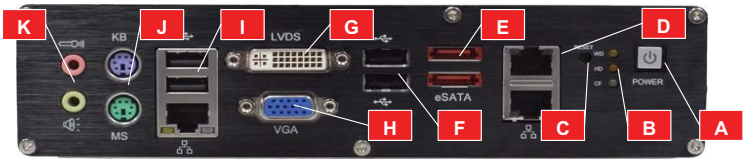
2.1 Mechanical Views

(all dimensions are in mm)



2.2 Front Panel I/O Connectors

This section describes the functions of the MXE-3000 I/O connectors



Symbol	Connector
A	Power Button
B	LED Indicators
C	Reset Button
D	Gigabit Ethernet x2 (Intel 82574)
E	eSATA x2
F	USB 2.0 connector x2 (Type A)
G	LVDS connector
H	VGA connector
I	USB 2.0 connector x2 (Type A) and Gigabit Ethernet (Realtek RT8111C)
J	Keyboard & Mouse PS2 connectors
K	MIC & Speaker Jacks

Table 2-1: MXE-3000 series connectors (front side)

2.2.1 Power Button

The power button is a non-latched push button with a blue LED indicator. The system turns on when the button is pressed, and the power LED lights. To shut down the system, the operating system can issue a shutdown command or the power button can be pressed. If the system halts, pressing the button for 5 seconds also forces the system off.

2.2.2 Reset Button

The reset button executes a hard reset for the MXE-3002 controller. Any pin-like object can be used to depress the reset button.

2.2.3 LED Indicators

In addition to the LED of the power button, three LED indicators are displayed on the front panel, Color, behavior, and function of the LED indicators are as follows.

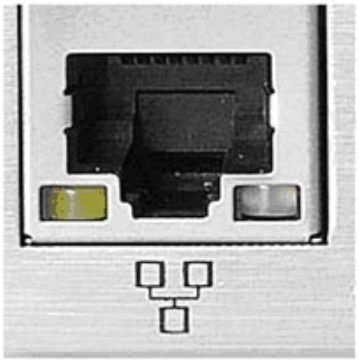
LED indicator	Color	Description
Watchdog (WD)	Yellow	Indicates the status of watchdog timer. When the watchdog timer is started, the LED flashes, and when the timer expires, the LED lights.
Hard disk drive (HD)	Red	Indicates the operating state of the HDD. When the SATA hard drive is operating, the LED indicator flashes.
Compact-Flash card (CF)	Green	Indicates the operating state of the CF card. When the CF card is operating, the LED indicator flashes.

Table 2-2: LED Indicators

2.2.4 Gigabit Ethernet connectors

The MXE-3000 has three Gigabit Ethernet ports on the front panel, consisting of two Intel 82574 and one Realtek RT8111C Ethernet controllers, supporting the following features.

- x1 PCI Express® interface with 2.5 GHz signaling
- Advanced error reporting
- Message signaled interrupts
- TCP segmentation offload/large-send support
- 802.3x flow control-compliant
- IEEE 802.1p and 802.1q support
- 10/100/1000 IEEE 802.3-compliant
- Automatic MDI/MDIX crossover at all speeds
- ACPI 2.0 specification
- Wake-On-Link feature
- SMBus 2.0 master interface for ASF functionality
- Serial Peripheral Interface (SPI) for ASF firmware



Active/Link Yellow	Speed LED Green/Orange

LED Color	Status	Description
Yellow	OFF	Ethernet port is disconnected.
	ON	Ethernet port is connected with no activity.
	Flashing	Ethernet port is connected and active.

Table 2-3: Active/Link LED

LED Color	Status	Description
Green/ Orange	OFF	10 Mbps
	Green	100 Mbps
	Orange	1000 Mbps

Table 2-4: Intel 82574 Speed LED

LED Color	Status	Description
Green/ Orange	Green	10 Mbps
	Green	100 Mbps
	Orange	1000 Mbps

Table 2-5: Realtek 8111C Speed LED

2.2.5 eSATA connectors

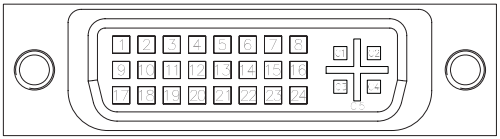
The MXE-3000 provides two SATA ports on the front panel, consisting of integrated AHCI controllers supports SATA interface HDD, SSD, and CD-ROM devices.

2.2.6 USB 2.0 Connectors

The MXE-3002 controller provides six USB 2.0 Type A ports on the front and rear panels. All USB ports are compatible with high-speed, full-speed and low-speed USB devices. The MXE-3002 controller supports multiple boot devices, including USB flash drive, USB external hard drive, USB floppy, USB CD-ROM and others. The boot priority and boot device can be configured in BIOS. Please refer to Section 4.5 for details.

2.2.7 LVDS connector

The LVDS connector, of DVI type, connects the MXE-3000 and LVDS interface panel. Connector pins are defined as follows.



For panels the inverter of which sets backlight to brightest when backlight control pin is pulled low:

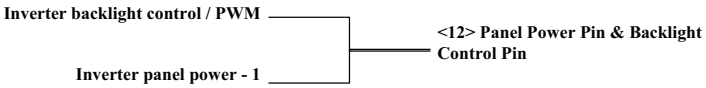
Pin #	Signal	Pin #	Signal
1	C_LVD_A_DATA2_N	16	C_LDDC_CLKt
2	C_LVD_A_DATA2_P	17	C_LVD_A_DATA0_N
3	DGND	18	C_LVD_A_DATA0_P
4	DGND	19	DGND
5	D12V_EXT	20	DGND
6	C_L_BRIGHTNESS	21	T/S_S/XR
7	C_LBKLT_EN_DELAY	22	DGND
8	C_LDDC_DATA	23	C_LVD_A_CLK_P
9	C_LVD_A_DATA1_N	24	C_LVD_A_CLK_N
10	C_LVD_A_DATA1_P	C1	T/S_H
11	DGND	C2	T/S_X/XL
12	PANEL_PWR	C3	T/S_Y/YT
13	DGND	C4	T/S_L/YB
14	PANEL_PWR	C5	
15	DGND		

For panels the inverter of which sets backlight to brightest when backlight control pin is pulled high:

Pin #	Signal	Pin #	Signal
1	C_LVD_A_DATA2_N	16	C_LDDC_CLKt
2	C_LVD_A_DATA2_P	17	C_LVD_A_DATA0_N
3	DGND	18	C_LVD_A_DATA0_P
4	DGND	19	DGND
5	D12V_EXT	20	DGND
6	N/A	21	T/S_S/XR
7	C_LBKLT_EN_DELAY	22	DGND
8	C_LDDC_DATA	23	C_LVD_A_CLK_P
9	C_LVD_A_DATA1_N	24	C_LVD_A_CLK_N
10	C_LVD_A_DATA1_P	C1	T/S_H
11	DGND	C2	T/S_X/XL
12	PANEL_PWR & C_L_BRIGHTNESS (*)	C3	T/S_Y/YT
13	DGND	C4	T/S_L/YB
14	PANEL_PWR	C5	
15	DGND		

The backlight control pin shares voltage level with panel power pin which should be consistent with the panel power requirements.

Suggested cable wiring is:



2.2.8 Keyboard & Mouse PS2 connectors

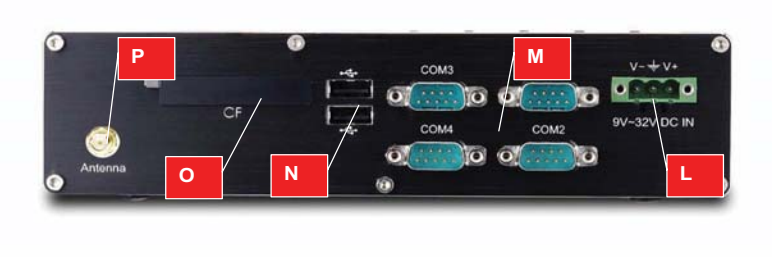
The MXE-3000 provides PS/2 connection of PS/2 keyboard and mouse. The green connector is for PS/ 2 mouse and the purple connector is for PS/2 keyboard.

2.2.9 Audio Jacks

The MXE-3000 implements Intel High Definition audio from the Realtek ALC888 chip. The HD audio supports up to 24-bit, 192 KHz sample rate high quality headphone/speaker output and microphone input. Audio jacks are accessed on the front panel of MXE-3000. The pink jack is for microphone input, and the green jack is for speaker output.

2.3 Rear Panel I/O Connectors

The MXE-3000 rear panel provides connection for DC power input, antenna, and 4x COM ports (four D-sub 9P connectors of COM1 to COM4), 2x USB ports and CF port.



L	DC power input
M	COM port connectors x4
N	USB ports x2
O	CF port
P	Antenna

2.3.1 DC Power Supply Connectors

The DC power supply connector of the MXE-3000 is on the rear panel. The power supply connector consists of three pins, V+, chassis ground, and V- from right to left respectively. V+ and V- pins are for DC power input and chassis ground pin allows to connect the chassis to ground for better EMC compatibility. The DC power input of MXE-3000 series controller allows a voltage input range from 9 VDC to 32 VDC.

2.3.2 COM Ports

The MXE-3000 provides 4x 9-pin male dub ports on the rear panel. The MXE-3000 COM1 and COM2 provide different modes of serial communication and are RS-232/RS-422/RS-485, which can be set in BIOS. Please refer to Section 4.1 for detail. COM3 and COM4 only provide RS-232.

PIN	Signal name		
	RS-232	RS-422	RS-485
1	DCD#	RXD422n	485n
2	RXD	RXD422p	485p
3	TXD	TXD422p	
4	DTR#	TXD422n	
5	GND		
6	DSR#		
7	RTS#		
8	CTS#		
9	RI#		

Table 2-6: D-sub 9P signals of COM1 & COM2 ports

PIN	Signal name
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

Table 2-7: D-sub 9P signals of COM3 & COM4 ports

2.3.3 USB connector

Function is the same as front panel USB port.

2.3.4 Compact-Flash port

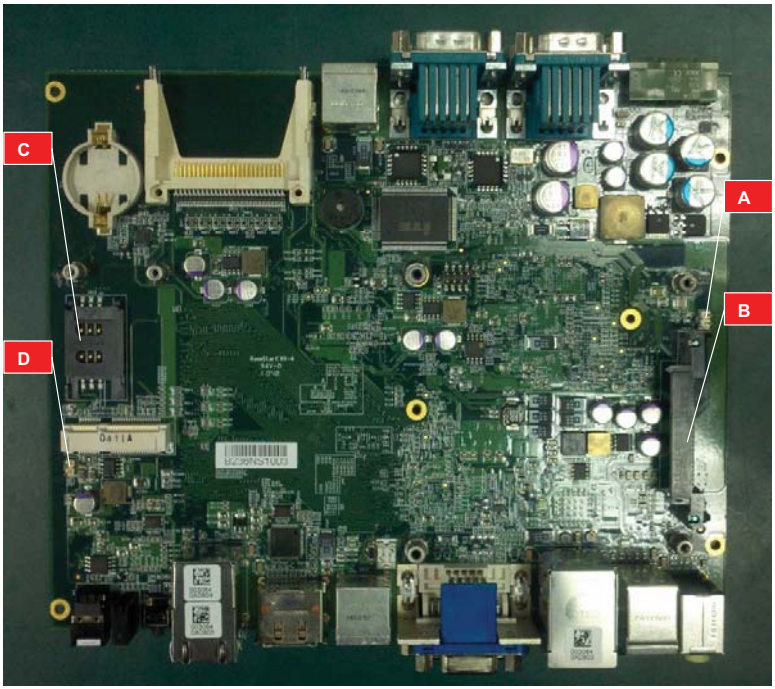
The MXE-3000 is equipped with a Type I Compact-Flash port located on the front panel. The MXE-3000 can be booted up via a CF card with OS installed. Due to the nature of SATA interface, the CF card cannot be hot-plugged and must be installed before system power on. Installation of a CF card is described in section 3.3.

2.3.5 Antenna connector

The MXE-3000 provides a SMA type antenna connector for WiFi or 3.5G module of and internal mini PCIe module.

2.4 Internal I/O Connectors

This section describes the internal I/O connectors of the MXE-3000 series controller. The interior of the MXE-3000 series controller is shown.



A	Clear CMOS jumpe
B	SATA connector
C	USIM port
D	Mini PCIe connector

2.4.1 Clear CMOS Jumper

If the MXE- 3000 fails to boot, this jumper clears the BIOS content stored in CMOS and restores the default settings. Pin#1 and pin#2 of CN2 are jumped and the system restores to normal mode.

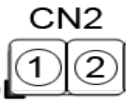
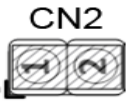
Normal	Clear
	

Table 2-8: Clear CMOS Jumper

2.4.2 SATA Connector

The MXE-3000 provides a SATA port supporting data transfer up to 3.0 Gbit/s (300 MB/s). The SATA host controller supports a legacy mode using I/O space and AHCI mode using memory space. The SATA connector is compatible with a 2.5 inch hard disk drive (HDD) or solid state disk (SSD). The HDD or SSD must be installed into SATA connector with a HDD bracket. Please refer to Section 3.1 for installation instructions for a 2.5 inch HDD or SSD.

2.4.3 USIM Port

Use of a 3.5G mini-PCIe module normally requires a SIM card to support communication with a telecom operator. The MXE-3000 provides a USIM port connected to mini-PCIe connector. The SIM card and 3.5G mini-PCIe module can be installed to facilitate 3.5G communication.

2.4.4 Mini-PCIe Connector

The MXE-3000 features a mini-PCIe connector inside the chassis to provide function expansion via installtion of a 3rd-party mini-PCIe module complying with mini PCIe standard 1.1, such as a WiFi module, 3.5G module or other, expanding functionality.

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3 Getting Started

This chapter discusses installation of a hard disk drive and a CompactFlash card into the system, as well as COM port jumper settings and wall-mount installation.

3.1 Replacing a Hard Disk Drive

Before installing a hard disk drive, the front panel, rear panel, and bottom chassis must be disassembled, according to the following instructions.

1. Use a #3 hex wrench to unscrew all 6 screws (M3 hex bolts) from the front panel and remove the panel.

.

2. Remove the 6 screws from the rear panel and remove the panel.

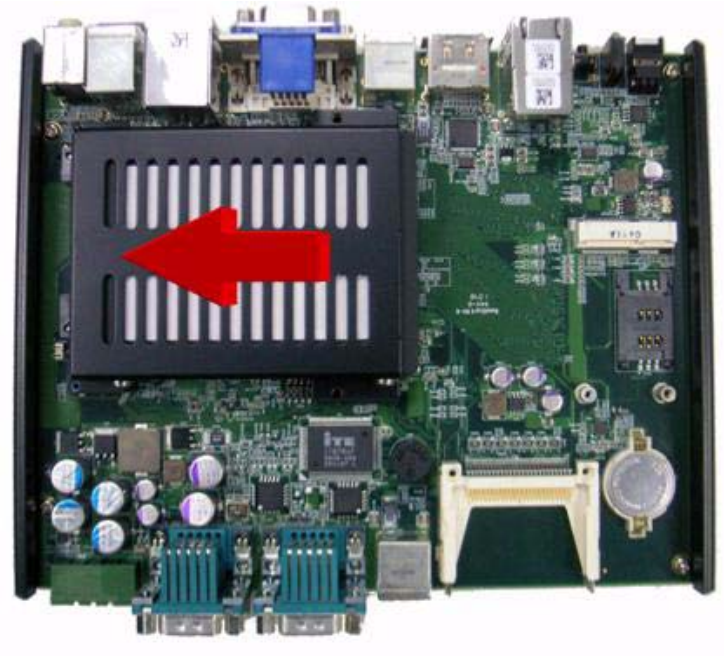
3. Remove the bottom chassis by sliding it off the top chassis.

4. The MXE-3000 series SBC ships with an attached empty HDD bracket. Unscrew the 4 screws and remove the HDD bracket..

5. Four M3 screws are included as accessories in the package. Fasten the 4 screws to fix a 2.5" HDD or SSD to the bracket..

6. Install the 2.5" HDD or SSD with the bracket by gently pushing the HDD/SSD connector (plug) into the SATA connector (receptacle) on the PCB

.

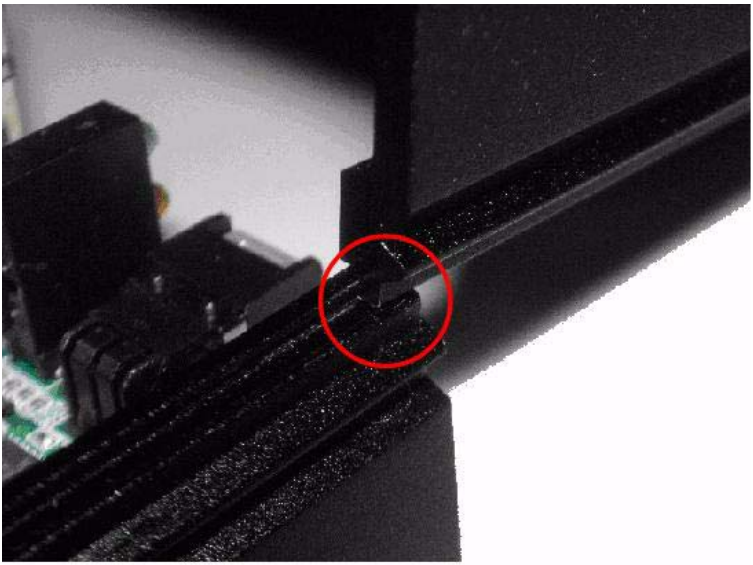


7. Fasten the 4 screws to fix the HDD bracket to the copper spacers.

.

8. Align the sliding parts as shown and reassemble the bottom chassis to the top chassis.

.



9. Reinstall all 12 screws (M3 hex bolts) into the front and rear panels.

3.2 Installing a CF card

The MXE-3000 series controller provides a CompactFlash port on the front panel to accommodate a CF card to supplement disk storage. A SATA HDD and CF card can further be simultaneously installed, and boot and device preferences set in the BIOS. Follow the instructions below to install the CF card.

1. Insert the CF card into the CF port on the front panel.

2. Aligning with the guide of the CF socket, push the CF card to the bottom of the socket.

.

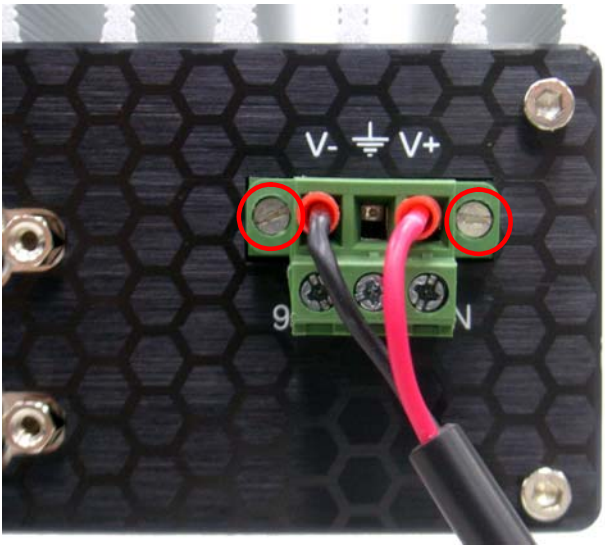
3.3 Connecting to DC power

Note: Before introducing DC power to the MXE-3000 series controller, ensure the voltage and polarity provided are compatible with the DC input. Improper input voltage and/ or polarity can be responsible for system damage.

The DC power input connector of the MXE-3000 controller is located on the rear panel. It has three pins, V+, chassis ground, and V- from right to left respectively. The DC power input accepts input voltage as shown previously.

1. Connect the DC power as shown in the Figure
2. Fix the DC connector using the 2 screws

.



3.4 Mounting using wall-mount kit

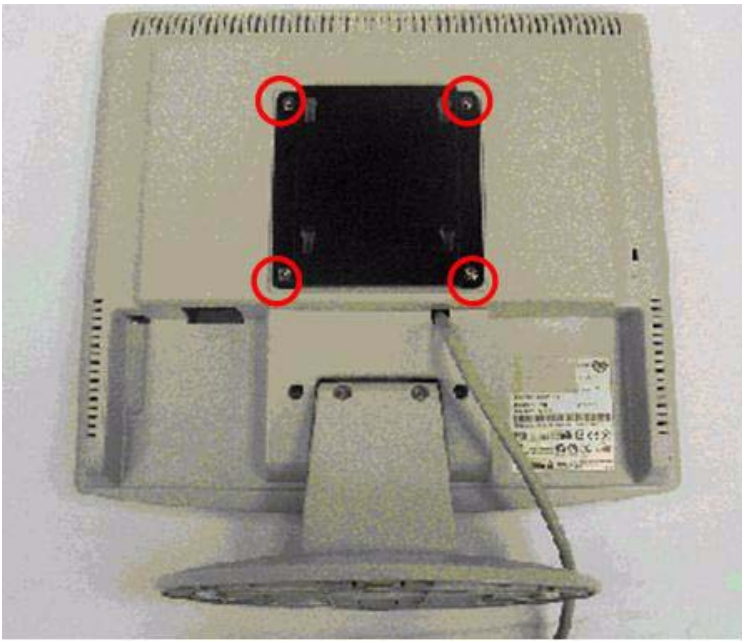
The MXE-3000 series controller is shipped with a VESA 100 wall-mount bracket. The bracket has four M4 mounting holes with a pitch of 100 mm, allowing fixing to any VESA 100 compatible mounting mechanism. The mounting bracket enables the MXE-3000 series controller to be mounted on a wall or the back of a monitor.

Mounting instructions for the MXE-3000 series follow.

1. Locate the wall-mount bracket and 4 M4 screws in the screw pack shipped with the chassis.

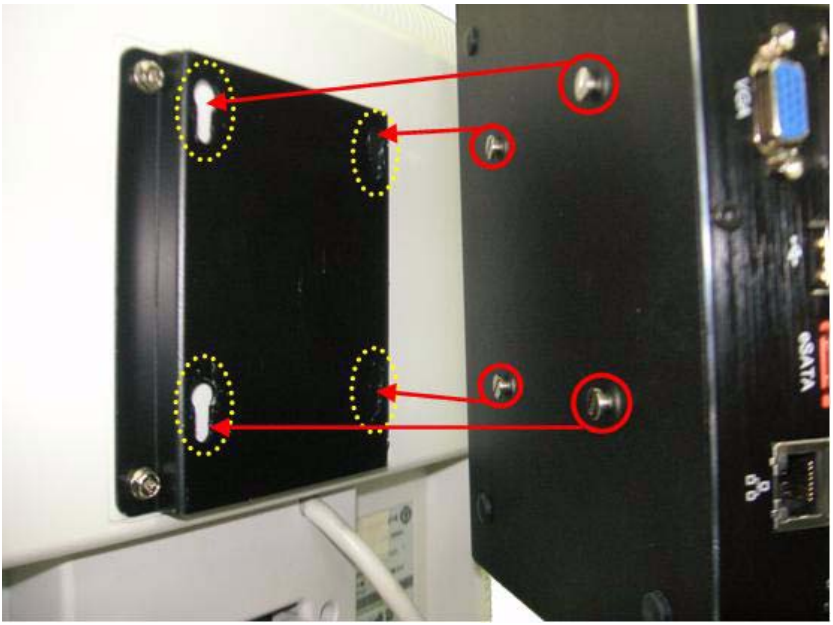
.

2. Install the 4 screws to fix the bracket to desired mounting surface (wall or monitor, as shown)



3. Locate the 4 dedicated screws for mounting in the screw pack. Install the 4 screws into the holes on the bottom of MXE-3000 series controller

4. Align the screws on the bottom of chassis with the key holes on the bracket.



5. .Push the MXE-3000 series controller down until a click is heard. The chassis is locked to the mounting bracket.

3.5 Cooling configuration

Heat generating components of the MXE-3000 controller, such as the CPU, northbridge and southbridge, are located on the top of the PCB. These components directly contact the top cover via thermal pads. Heat generated by the components is largely dissipated therethrough. To maximize efficiency of heat dissipation, maintain a minimum of 2 inches (5 cm) clearance on the top of the MXE-3000 controller.

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4 BIOS Settings

The Basic Input/Output System (BIOS) is a program that provides a basic level of communication between the processor and peripherals. In addition, the BIOS also contains codes for various advanced features applied to the MXE-3000 serial controller. The BIOS setup program includes menus for configuring settings and enabling features of MXE-3000 series. Most users do not need to use the BIOS setup program, as the MXE-3000 series controller ships with default settings that work well for most configurations.

Warning: Changing BIOS settings may lead to incorrect controller behavior and possible inability to boot. In such a case, Section 2.4.4 provides instruction on clearing the CMOS and restoring default settings.

4.1 Main

4.1.1 System Time/System Date

Use this option to specify the system time and date. Highlight System Time or System Date using the up or down <Arrow> keys. Enter new values using the keyboard then press <Enter> key. Press the < Tab > key to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

Note: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

4.2 Advanced

4.2.1 CPU Configuration

4.2.1.1 Hyper Threading Technology

This option allows you to Enable/Disable Hyper-Threading Technology.

Intel® SpeedStep™ Tech
This option enables or disables Intel SpeedStep™ technology.

4.2.2 IDE Configuration

ATA / IDE Configuration
This item specifies whether the IDE channels should be initialized in Enhanced Mode or disabled. The settings are Disabled and Enhanced. The default option is Enhanced.

Configure SATA as
This item specifies whether the SATA channels should be initialized as IDE Mode or AHCI Mode. The settings are IDE and AHCI. The default option is IDE.

4.2.3 SuperIO Configuration

Serial Port1/ Port2/ Port3/ Port4 Address
These four options specify the base I/O port address of serial port1 to serial port4.

Note: Do not set the same value for different serial ports to avoid resource conflict.

Watchdog Function
This option specifies whether Watchdog Function is enabled or disabled. The default option is Enable.

4.2.4 Hardware Health Configuration

The hardware health option allows users to monitor hardware status including CPU temperature, system temperature, and system voltages (Vcore, +5V, +3.3V, +12V, +1.8V, 5VSB, VBAT).

4.2.5 ACPI Configuration

Suspend mode
Indicates which state the ACPI supported system will enter when suspend is activated. The options are S1, S3 or Auto. The default option is Auto.

Energy Lake Feature
Enables or disables the Energy Lake Feature. The default option is Disabled.

USB Device Wakeup From S3/S4
Enables or disables USB waking the system from S3 or S4. The default option is Disabled.

Resume On LAN
Enables or disables LAN device resumption of the system. The default option is Disabled.

High Performance Event Timer
Enables or disables HPET. The default option is Enabled.

Resume On RTC Alarm
Enables or disables RTC alarm resumption of the system. The default option is Disabled.

4.2.6 ACHI Settings

ACHI BIOS Support
Enables or disables BIOS support on AHCI. The default option is Enabled.

4.2.7 USB Configuration

Legacy USB Support
Legacy USB Support refers to USB mouse and keyboard support. Normally if this option is not enabled, an installed USB mouse or keyboard will not become available until a USB compatible operating system is fully booted with all USB drivers

loaded. When this option is enabled, attached USB mouse or keyboard are activated even when no USB drivers are loaded on the system. Set this value to enable or disable the Legacy USB Support.

Option	Description
Disabled	When set, prevents the use of any USB device in DOS or during system boot.
Enabled	When set allows the use of USB devices during boot and while using DOS.
Auto	Auto detects USB keyboards or mice and if found, allows them to be utilized during boot or while using DOS.

Table 4-1: Legacy USB support

USB 2.0 Controller Mode
Configures the data rate of the USB port. The options are Full-Speed (12 Mbps) and HiSpeed (480 Mbps).

BIOS EHCI Hands-Off
Enables BIOS support for EHCI Hands-Off feature. The default option is Enabled.

USB Mass Storage Device Configuration
This is a submenu for configuring the USB Mass Storage Class Devices which are in use on the USB ports found by BIOS. Emulation Type can be set according to the type of attached USB mass storage device(s). If set to Auto, USB devices smaller than 530MB will be emulated as Floppy and those greater than 530MB will remain as hard drives. The Forced FDD option can be used to force a hard disk type drive to boot as FDD (Ext. ZIP Drive).

4.3 Chipset

4.3.1 Northbridge Configuration

DRAM Frequency
Selects frequency of the Dynamic Random Access Memory.

Configure DRAM Timing by SPD
Selects whether the DRAM clock is automatically determined by SPD (Serial Presence Detect)

Internal Graphics Mode Select
Selects the amount of system memory to be used by the internal graphics device.. 8MB is recommended.

DVMT Mode Select
Dynamic Video Management Technology (DVMT) allows additional system memory to be dynamically allocated for graphics usage based on application needs. Once the application is closed, memory that was allocated is released and made available for system use. This ensures a solid balance between system performance and graphics performance.

Option	Description
DVMT Mode	The graphics chip will dynamically allocate system memory as graphics memory, according to system and graphics requirements.

Table 4-2: DVMT Mode Select

Boot Display Device
Select system boot display device from CRT, EFT or CRT+EFP. The default option is VBIOS-Default.

Flat Panel Type
Selects panel resolution of LVD output. Options are 640x480, 800x600, 1024x768, 1366x768.

4.3.2 Southbridge Configuration

USB Functions
Selects the number of USB ports to be enabled.

HDA Controller
Enables or disables the HDA controller. The default option is Enabled.

Restore On Power Loss
Defines what state the computer enters when power is restored after a power loss. The options for this value are Last State, Power On and Power Off.

Option	Description
Power Off	Set this value to always power the system down when power is restored.
Power On	Set this value to always power the system up when power is restored.
Last State	Set this value to power the system up or down based on the previous system power state when power is restored.

Table 4-3: Restore On Power Loss

Panel Power Select
Selects LVDs panel power output. The options are low (3V) and high (5V).

4.4 Security

The Security setup menu provides both a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.

To uninstall the passwords, simply set a NULL password.

Change Supervisor Password
Select **Change Supervisor Password** and press < Enter >. And enter your password in the appearing message box as

prompted. The password is stored in NVRAM after setup completes.

User Access Level
This option appears after specifying Supervisor password, and allows you to specify the access level for users.

Option	Description
No Access	Users are not allowed to access the BIOS setting.
View Only	Users are allowed to view BIOS setting but not allowed to change it.
Limited	Users are allowed only to change limited items in BIOS.
Full Access	Users are allowed to access and change all setting items in BIOS.

Change User Password
Select **Change User Password** and press < Enter >. And enter your password in the appearing message box as prompted. The password is stored in NVRAM after setup completes.

Password Check
This option appears after specifying Supervisor password.

Option	Description
Setup	Check password when entering BIOS setup.
Always	Check password when system booting.

Table 4-4: Password Check

4.5 Boot

4.5.1 Boot Settings Configuration

Quick Boot

Option	Description
Disabled	Specify BIOS to perform all POST tests.

Option	Description
Enabled	Specify BIOS to skip certain POST test to boot faster.

Quiet Boot

Option	Description
Disabled	Specify BIOS to display POST messages.
Enabled	Specify BIOS to display the OEM logo.

Bootup Num-Lock
Specify whether the Number Lock is on or off after power-on.

Wait for 'F1' If Error
If this option is specified as Disabled, BIOS does not wait for users to press the <F1> key if any error occurs.

Hit 'DEL' Message Display
If this option is specified as Enabled, the system displays the message "Press DEL to run Setup during POST"

Intel 82574L PXE ROM
Disabled/Enabled the Intel 82574L PXE ROM closes/opens Intel lan PXE function.

Realtek 8111C PXE ROM
Disabled/Enabled the Realtek 8111C PXE ROM closes/opens Intel lan PXE function.

4.5.2 Boot Device Priority

Specifies the priority of boot devices. All installed boot devices are detected during POST and displayed on the screen, with selsection as follows.

Boot from a SATA hard drive

1. Select **Hard Disk Drives** and press Enter.
2. SATA hard drive is displayed with its identification string. Specify it as **1st Drive**.
3. Go back to upper level and select SATA hard drive as **1st Boot Device**.

Boot from CF card

1. Select **Hard Disk Drives** and press Enter.
2. CF card is displayed with its identification string. Specify it as **1st Drive**.
3. Go back to upper level and select CF card as **1st Boot Device**.

Boot from USB CD/DVD drive

1. Select **USB Drives** and press Enter.
2. CD/DVD drive is displayed with its identification string. Specify it as **1st Drive**.
3. Go back to upper level and select CD/DVD drive as **1st Boot Device**.

Boot from USB Flash disk

1. Select **USB Drives** and press Enter.
2. USB flash disk is displayed with its identification string. Specify it as **1st Drive**.
3. Go back to upper level and select USB flash disk as **1st Boot Device**.

Boot from Network Drives

1. Select Network Drives and press Enter.
2. The network drive is displayed with its identification string. Specify it as 1st Drive.
3. Go back to upper level and select the network drive in 1st Boot Device.

4.6 Exit

Save Changes and Exit
When changes to the BIOS settings are complete, select this option to save all changes and reboot the system, after which the new settings take effect.

Discard Changes and Exit
Select this option to discard all changes and exit BIOS setup..

Discard Changes
Select this option to discard all changes without exiting BIOS setup.

Load Optimal Defaults
Select this option to set all BIOS options to default settings. The Optimal setting is designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Setup options if the computer encounters system configuration problems.

Load Failsafe Defaults
Select this option to set all BIOS options to default settings. The Failsafe setting is designed for maximum system stability, but not maximum performance. Select the Fail-Safe Setup options if the computer encounters system configuration problems.

5 Driver Installation

After installing the operating system, you need to install all related drivers to make the system work accordingly. This section describes the drivers needed for Windows operating systems and the procedures to install them. For other OS support, please contact ADLINK for further information.

To install Windows drivers, please follow the steps below:

1. Properly install Windows before installing any drivers. Most of the standard I/O device drivers have been included in Windows.
2. Install the chipset driver.
3. Install the graphics driver.
4. Install the Ethernet driver.
5. Install the WDT (watchdog timer) driver.

5.1 Install the Chipset Driver

This section describes installation of the chipset driver for the MXE-3002 controller. The chipset driver outlines to the operating system how to configure the Intel® GM45 chipset components in order to ensure that the following features function properly:

- Core PCI and ISAPNP Services
- PCIe Support
- IDE/ATA33/ATA66/ATA100 Storage Support
- SATA Storage Support
- USB Support
- Identification of Intel® Chipset Components in the Device Manager

One of the following operating systems must be fully installed and running on the system before installing this software:

- Microsoft Windows 2000*
- Microsoft Windows 7, 32-bit*
- Microsoft Windows 7, 64-bit*
- Microsoft Windows Server 2003 Enterprise x64 Edition*
- Microsoft Windows Server 2003*, Windows Server 2008 Standard x64*
- Microsoft Windows Server 2008 Standard*
- Microsoft Windows Server 2008*
- Microsoft Windows Vista 32*
- Microsoft Windows Vista 64*
- Microsoft Windows XP 64-Bit Edition*
- Microsoft Windows XP*

to install the chipset driver for the MXE-3002 controller:

1. Close any running application.
2. Insert the ADLINK All-in-One DVD. The chipset driver is located in the directory:
   x:\Driver Installation\Matrix\MXE-3002\Chipset\
   where x: denotes the DVD-ROM drive.
3. Execute Setup.exe and follow on-screen instructions to complete the setup.
4. After installation completes, reboot the system.

5.2 Install the Graphics Driver

This section describes the procedure to install the graphics driver of the MXE-3002 controller. The MXE-3002 controller is equipped with Intel® 4500MHD graphics media accelerator integrated in Intel Mobile Intel® GM45 chipset. The Intel® Graphics Media

Accelerator Driver package supports the following operating systems:

- Microsoft Windows 7 Enterprise, 32-bit version*
- Microsoft Windows 7 Home Basic, 32-bit version*
- Microsoft Windows 7 Home Premium, 32-bit version*
- Microsoft Windows 7 Professional, 32-bit version*
- Microsoft Windows 7 Ultimate, 32-bit version*
- Microsoft Windows 7*, Windows 7, 32-bit*
- Microsoft Windows Vista 32*
- Microsoft Windows Vista Business, 32-bit version*
- Microsoft Windows Vista Enterprise, 32-bit version*
- Microsoft Windows Vista Home Basic, 32-bit version*
- Microsoft Windows Vista Home Premium, 32-bit version*
- Microsoft Windows Vista Ultimate, 32-bit version*

To install the graphics driver.

1. Close any running application.
2. Insert the ADLINK All-in-One DVD. The graphics driver is located in the directory x:\Driver Installation\Matrix\MXE-3002\Graphics\ where x: denotes the DVD-ROM drive.
3. Execute Setup.exe and follow on-screen instructions to complete the setup.
4. After installation completes, reboot the system.

5.3 Install the Ethernet Driver

To install the Ethernet driver with Intel WG82574L and Realtek 8111C Gigabit Ethernet controller for Windows 2000 and XP:

1. Close any running application.
2. Insert the ADLINK All-in-One DVD. The chipset driver is located in the directory:
   x:\Driver Installation\Matrix\MXE-3002\LAN-Intel\
   x:\Driver Installation\Matrix\MXE-3002\LAN-Realtek\
   where x: denotes the DVD-ROM drive.
3. Execute setup.exe and follow on-screen instructions to complete the setup.
4. After installation completes, reboot the system.

5.4 Install the Audio Driver

This section describes the procedure to install the audio driver of MXE-3000 . The MXE-3000 supports Intel High Definition audio using Realtek ALC888 audio codec. Follow the steps to install audio driver for MXE-3000.

For Windows 2000 and XP and Vista users:

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD. The audio driver is located in the directory:
   x:\Driver Installation\Matrix\MXE-3000\Audio\
   where x: denotes the DVD-ROM drive.
3. Execute Setup.exe and follow on-screen instructions to complete the setup.
4. When installation is complete, reboot the system.

5.5 Install the WDT Driver

A WDT (watchdog timer) resets the system when the operating system or application is halted. A typical use of a WDT starts and periodically resets the timer, and when timer is expired, the system resets. The WDT driver must be installed prior to programming the WDT.

To install WDT driver for the MXE-5140M controller:

1. Close any running applications.
2. Insert the ADLINK All-in-One DVD. The WDT driver is located in the directory
   x:\Driver Installation\Matrix\MXE-3002\WDT
   where x: denotes the DVD-ROM drive.
3. Execute setup.exe and follow on-screen instructions to complete the setup.

Reboot the system.

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A Appendix

A.1 Watchdog Timer (WDT) Function Reference

This appendix describes the usage of the watchdog timer (WDT) function library for the MXE-3000 controller. Watchdog timer is a hardware mechanism to reset the system in case the operating system or an application halts. After starting watchdog timer, you need to periodically reset the watchdog timer in the application before the timer expires. Once watchdog timer expires, a hardware-generated signal is sent to reset the system.

To use the WDT function library for MXE-3000 series, you need to include the header file WDT.h and linkage library WDT.lib in your C++ project.

InitWDT

@ Description

Initialize the watchdog timer function of MXE-3000 controller. InitWDT must be called before the invocation of any other WDT function.

@ Supported controllers

MXE-3000

@ Syntax

C/C++

```
BOOL InitWDT()
```

@ Parameters

None

@ Return code

TRUE if watchdog timer is successfully initialized.

FALSE if watchdog timer is failed to initialize.

SetWDT

@ Description

Set the timeout value of watchdog timer. There are two parameters for this function to indicate the timeout ticks and unit. Users should call ResetWDT or StopWDT before the expiration of watchdog timer, or the system will be reset.

@ Supported controllers

MXE-3000

@ Syntax

C/C++

```
BOOL SetWDT(BYTE tick, BYTE unit)
```

@ Parameters

`tick`

Specify the number of tick for watchdog timer. A valid value is 1 - 255.

`unit`

Specify the timeout ticks of the watchdog timer.

Value	Description
0	The unit of tick is second. For example, when you specify tick as 100 and unit as 0, the timeout value is 100 seconds.
1	The unit of tick is minute. For example, when you specify tick as 100 and unit as 1, the timeout value is 100 minutes.

@ Return codes

TRUE if timeout value of watchdog timer is successfully set.

FALSE if timeout value of watchdog timer is failed to set.

StartWDT

@ Description

Start the watchdog timer function. Once the StartWDT is invoked, the countdown of watchdog timer starts. Users should call ResetWDT or StopWDT before the expiration of watchdog timer, or the system will be reset.

@ Supported controllers

MXE-3000

@ Syntax

C/C++

```
BOOL StartWDT()
```

@ Parameters

None

@ Return codes

TRUE if watchdog timer is successfully started.

FALSE if watchdog timer is failed to start.

ResetWDT

@ Description

Reset the watchdog timer. The invocation of ResetWDT allows users to restore the watchdog timer to the initial timeout value specified in SetWDT function. Users should call ResetWDT or StopWDT before the expiration of watchdog timer, or the system will be reset.

@ Supported controllers

MXE-3000

@ Syntax

C/C++

```
BOOL ResetWDT()
```

@ Parameters

None

@ Return codes

TRUE if watchdog timer is successfully reset.

FALSE if watchdog timer is failed to reset.

StopWDT

@ **Description**

Stop the watchdog timer.

@ **Supported controllers**

MXE-3000

@ **Syntax**

C/C++

```
BOOL StopWDT()
```

@ **Parameters**

None

@ **Return codes**

TRUE if watchdog timer is successfully stopped.

FALSE if watchdog timer is failed to stop.